



May 31, 2012

Riffe Homes, Inc.
450 Winnebago Drive
Lake Winnebago, MO 64034

Re: 1721 Woodland Shores Ct
Permit #2010-0119
Bresnahan Residence

Apex Engineers, Inc. observed the framing of the house at 1721 Woodland Shores Ct. Our firm was retained to address comments from the city rough-in inspection.

Have engineer address basement window header support at curved wall.

- The basement window headers are supported with two full height 2x6 studs and a minimum of a 1-1/8"x5.5" jack stud under the beam ends. After computations, the existing framing is adequate.

Provide joist layout per plan above kitchen area – double every other joist and 3x 2x10 joists.

- The ceiling joist orientation and roof point load locations were altered to minimize loads on the joists above the kitchen. The roof support leg bearing on the wall between bedroom #2 and the master walk-in-closet shall be moved to a wall marked for load bearing. With the removal of the roof point loads, the existing floor joists will support a design loads.

Provide steel columns in garage per plan or have engineer ok.

- The steel posts were substituted with a (7) 2x4 built-up stud column. After computations, the existing built-up stud columns will support the design loads.

Our firm was also asked to address the support of the great room steel beam at the stairs.

- The steel beam is upset and restrained from rotation by intersecting floor joists. The web of the steel beam bears on the supporting built-up column. A minimum of a (3) 2x6 built-up stud column is required to support the design loads. The flange of the steel beam may overhang the side of the column by up to 3".

Contingent upon the aforementioned repair, our firm recommends approval of these framing items. Please call if our firm can be of further assistance.

LIMITATIONS

The scope of our services includes only those items specifically addressed herein. All other items are outside the scope of this inspection; including but not limited to, any environmental assessment (such as, but not limited to mold, mildew, presence of hazardous or toxic materials in the soil, surface water, ground water, etc.).

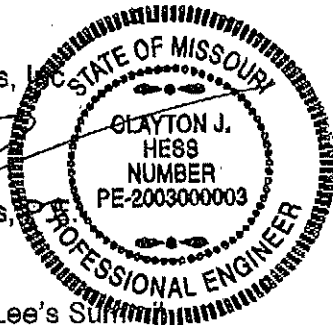


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1721 Woodland Shores Ct
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In addition, the scope our services does not include any evaluation of the building or site for job-site safety and/or hazardous conditions. All construction shall be performed in compliance with IRC and OSHA standards at all times. Our firm has not been retained to examine the site or building for any of these conditions. In addition, the contractor shall retain sole responsibility for the quality of work, for adhering to plans, specifications, appropriate codes, and, for repairing defects, deficiencies or omission, regardless of when they are found.

Best Regards,
Apex Engineers, Inc.

Clayton J. Hess,
Principal



cc: City of Lee's Summit



Apex Engineers, Inc.
Clayton J. Hess, P.E.
9000 W 64th Terrace
Merriam, KS 66202
913-432-3222
info@apex-engineers.com

Title:
Engineer:
Project Desc.:

Job #

10T2

Printed: 1 JUN 2012, 1:44PM

File: C:\Users\chess\Documents\ENERCALC Data Files\clayton2.ec6
ENERCALC: INC. (1993-2011) Build: 6.12.5.17, Ver: 6.12.5.17

Licensee: APEX ENGINEERS INC

Wood Column

Lic. #: KW-06005244

Description: Basement Columns - Riffe - 1721 Woodland Shores Ct

General Information

Calculations per 2005 NDS, ASCE 7-05

Analysis Method: Allowable Stress Design
End Fkts: Top & Bottom Pinned

Overall Column Height 10.0 ft

(Used for non-slender calculations)

Wood Species: Douglas Fir - Larch (North)
Wood Grade: No. 1/No. 2

Fb - Tension 850.0 psi Fv 180.0 psi
Fb - Compr 850.0 psi FI 500.0 psi
Fc - Ptl 1,400.0 psi Density 31.570 pcf
Fc - Perp 625.0 psi

E: Modulus of Elasticity ... x-x Bending y-y Bending Axial
Basic 1,600.0 1,600.0 1,600.0 ksi
Minimum 580.0 580.0

Load Combination 2006 IBC & ASCE 7-05

Wood Section Name: 2-2x6
Wood Grading/Manuf.: Graded Lumber
Wood Member Type: Sawn

Exact Width: 3.0 in Allowable Stress Modification Factors
Exact Depth: 5.50 in

Area: 16.50 in² Cf or Cv for Bending 1.30
Ix: 41.594 in⁴ Cf or Cv for Compression 1.10
Iy: 12.375 in⁴ Cf or Cv for Tension 1.30
Cm: Wet Use Factor 1.0
Ct: Temperature Factor 1.0
Clu: Flat Use Factor 1.0
Kf: Built-up columns 1.0 NDS 16.3.2
Use Cr: Repetitive? No (non-glb only)

Brace condition for deflection (buckling) along columns:

X-X (width) axis: Fully braced against buckling along X-X Axis

Y-Y (depth) axis: Unbraced Length for Y-Y Axis buckling = 9 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included: 36.174 lbs * Dead Load Factor

AXIAL LOADS ...

Axial Load at 10.0 ft, D = 0.40, L = 1.60 k

Axial Load at 10.0 ft, D = 0.60, L = 1.20 k

BENDING LOADS ...

Lat. Uniform Load creating Mx-x, W = 0.04330 k/ft

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio = 0.4202 : 1
Load Combination +D+W+H
Governing NDS Formula Comp + Mxx, NDS Eq. 3.9-3
Location of max. above base 4.966 ft
At maximum location values are ...
Applied Axial 1.036 k
Applied Mx 0.5412 k-ft
Applied My 0.0 k-ft
Fc: Allowable 621.46 psi

PASS Maximum Shear Stress Ratio = 0.07290 : 1
Load Combination +D+W+H
Location of max. above base 10.0 ft
Applied Design Shear 13.121 psi
Allowable Shear 180.0 psi

Maximum SERVICE Lateral Load Reactions ..

Top along Y-Y 0.2165 k Bottom along Y-Y 0.2165 k
Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections ...

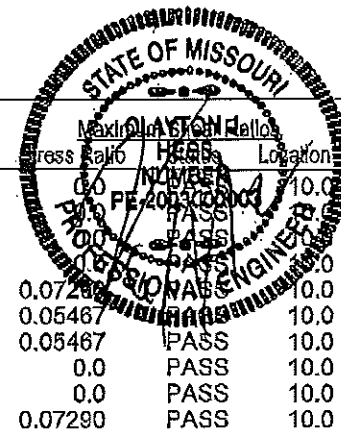
Along Y-Y 0.1480 in at 5.034 ft above base
for load combination: W Only
Along X-X 0.0 in at 0.0 ft above base
for load combination: n/a

Other Factors used to calculate allowable stresses ...

Cf or Cv: Size based factors Bending 1.300 Compression 1.100 Tension

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios	Status	Location
+D	0.07645	PASS	0.0 ft
+D+L+H	0.2830	PASS	0.0 ft
+D+0.750L+0.750L+H	0.2314	PASS	0.0 ft
+D+0.750L+0.750S+H	0.2314	PASS	0.0 ft
+D+W+H	0.4202	PASS	4.966 ft
+D+0.750L+0.750L+0.750W+H	0.4126	PASS	4.966 ft
+D+0.750L+0.750S+0.750W+H	0.4126	PASS	4.966 ft
+D+0.750L+0.750L+0.5250E+H	0.2314	PASS	0.0 ft
+D+0.750L+0.750S+0.5250E+H	0.2314	PASS	0.0 ft
+0.60D+W+H	0.4058	PASS	4.966 ft



Jun. 4. 2012 10:51AM

No. 3600 P. 4/4



APEX ENGINEERS, INC.
Clayton J. Hess, P.E.
9000 W 64th Terrace
Merriam, KS 66202
913-432-3222
Info@apex-engineers.com

Title:
Engineer:
Project Desc.:

Job #

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Printed: 31 MAY 2012, 6:33PM

File: C:\Users\chess\Documents\ENERCALC Data Files\clayton2.ec6
ENERCALC, INC. 1993-2011, Build: 6.12.6.17, Ver: 6.12.6.17

Wood Beam

Lic. #: KW-06005244

Licensee: APEX ENGINEERS, INC.

Description: --None--

Material Properties

Calculations per NDS 2005, ASCE 7-05

Analysis Method: Load Resistance Factor D
Load Combination 2006 IBC & ASCE 7-05

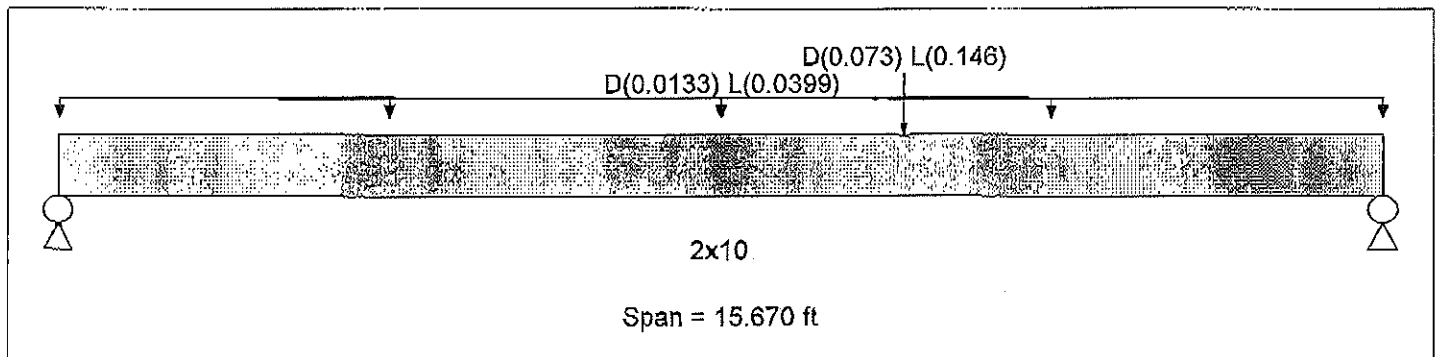
Fb - Tension 900.0 psi
Fb - Compr 900.0 psi
Fc - Prll 1,350.0 psi
Fc - Perp 625.0 psi
Fv 180.0 psi
Ft 575.0 psi

E: Modulus of Elasticity
Ebend-xx 1,600.0 ksi
Eminbend-xx 580.0 ksi

Wood Species: Douglas Fir - Larch
Wood Grade: No.2

Beam Bracing: Beam is Fully Braced against lateral-torsion buckling

Density 32.210pcf
Repetitive Member Stress Increase

**Applied Loads**

Service loads entered. Load Factors will be applied for calculations.

Uniform Load: D = 0.010, L = 0.030 ksf, Tributary Width = 1.330 ft
Point Load: D = 0.0730, L = 0.1460 k @ 10.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.786	1	Maximum Shear Stress Ratio	=	0.215	1
Section used for this span		2x10		Section used for this span		2x10	
fb: Actual	=	1,932.37	psi	fv: Actual	=	83.67	psi
FB: Allowable	=	2,459.18	psi	Fv: Allowable	=	388.80	psi
Load Combination		+1.20D+0.50Lr+1.60L+1.60H		Load Combination		+1.20D+0.50Lr+1.60L+1.60H	
Location of maximum on span	=	9.324	ft	Location of maximum on span	=	14.965	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward L+Lr+S Deflection		0.460	in	Ratio =		409	
Max Upward L+Lr+S Deflection		0.000	in	Ratio =		0 < 360	
Max Downward Total Deflection		0.633	in	Ratio =		297	
Max Upward Total Deflection		0.000	in	Ratio =		0 < 240	

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios				Member Values										Shear Values		
Segment Length	Span #	M	V	λ							Mu	Fb	Fc	Ft	Fv	Fv		
+1.40D																		
Length = 15.670 ft	1	0.205	0.055	1.000	1.100	1.150	1.000	1.000	1.000	1.000	0.20	900.12	2459.16	0.00	0.00	0.00		
+1.20D+0.50Lr+1.60L+1.60H																		
Length = 15.670 ft	1	0.786	0.215	1.000	1.100	1.150	1.000	1.000	1.000	1.000	3.44	900.12	2459.16	0.00	0.00	0.00		
+1.20D+1.60L+0.50S+1.60H																		
Length = 15.670 ft	1	0.786	0.215	1.000	1.100	1.150	1.000	1.000	1.000	1.000	3.44	900.12	2459.16	0.00	0.00	0.00		
+1.20D+1.60Lr+0.50L																		
Length = 15.670 ft	1	0.366	0.100	1.000	1.100	1.150	1.000	1.000	1.000	1.000	1.60	900.12	2459.16	0.00	0.00	0.00		
+1.20D+0.50L+1.60S																		
Length = 15.670 ft	1	0.366	0.100	1.000	1.100	1.150	1.000	1.000	1.000	1.000	1.60	900.12	2459.16	0.00	0.00	0.00		
+1.20D+0.50Lr+0.50L+1.60W																		
Length = 15.670 ft	1	0.366	0.100	1.000	1.100	1.150	1.000	1.000	1.000	1.000	1.60	900.12	2459.16	0.00	0.00	0.00		
+1.20D+0.50L+0.50S+1.60W																		
Length = 15.670 ft	1	0.366	0.100	1.000	1.100	1.150	1.000	1.000	1.000	1.000	1.60	900.12	2459.16	0.00	0.00	0.00		
+1.20D+0.50L+0.20S+E																		
					1.100	1.150	1.000	1.000	1.000	1.000			0.00	0.00	0.00	0.00		

